

Appendix G: Public Comments on the 2008 Integrated Report and Louisiana Department of Environmental Quality’s Response to Comments

The following table is a compilation of all comments received regarding the 2008 Integrated Report, along with LDEQ’s response to those comments. Any changes made to the 2008 Integrated Report based on public comments are noted in the column entitled, “Summary of LDEQ Responses.”

Commenters	Summary of Comments/Questions	Summary of LDEQ Responses
Tulane Environmental Law Clinic (TELC), on behalf of Gulf Restoration Network (GRN) Received 10/15/2008	1. TELC comment I.A: Louisiana Department of Environmental Quality (LDEQ) inappropriately used downstream testing to determine water quality of a water body.	1. LDEQ’s water quality monitoring program is designed to characterize ambient surface water quality conditions and collect data to make water quality standards attainment decisions. The state uses the most efficient monitoring design that best serves its monitoring objectives, which includes assessing water quality impacts. Location of sampling sites near the lower end of a subsegment helps to identify causes and sources of water quality impairments within subsegments and better address water quality conditions within the watershed. Occasionally sampling downstream of the subsegment boundary is necessary in instances where readily accessible sample points, typically bridge sites, are not available at or upstream of the subsegment boundary.
	2. TELC comment I.B: LDEQ fails to include parameters for metals for primary contact recreation (PCR) and secondary contact recreation (SCR) water bodies.	2. In conducting metals assessments LDEQ considers both the fish and wildlife propagation (FWP) and the human health drinking water supply (DWS) criteria. Current metals aquatic life criteria are more protective for any incidental contact or ingestion by humans for non-drinking water sources than are metals criteria for PCR and SCR water bodies.
	3. TELC comment I.C: LDEQ fails to provide the documentation required by 40 C.F.R. §130.7(b)(6) for delisted water bodies.	3. The delistings mentioned in this comment are based on the same assessment procedures described in the Rationale and table 2 of the 2008 IR public notice. Therefore, the required “documentation” is implicit in the overall assessment methodology described in the Rationale and final 2008 IR.
	4. TELC comment I.D: LDEQ changes classifications for water bodies in basins that were not monitored without explaining what data those changes are based on.	4. Assessment classifications that changed were based on new data or information that became available for the period of record January 1, 2004 through October 30, 2007.
	5. TELC comment I.E: LDEQ did not include information about methods it used in collecting the data used to prepare the 2008 IR.	5. Page 2 paragraph 2 of the Rationale states, “In order for water quality or other related data to be utilized for §305(b) reporting and §303(d) listing, sample collection, handling, and laboratory analysis must be in accordance with LDEQ’s Quality Assurance Project Plan (QAPP) developed by LDEQ and approved by USEPA Region 6.” Most of the data used for IR purposes is collected by LDEQ and meet requirements of the QAPP and Standard Operating Protocol (SOP), which are available upon request.
	6. TELC comment I.F: LDEQ fails to describe water bodies that are Category 5 for nitrate/nitrite and for phosphorus as Category 5 for dissolved oxygen.	6. LDEQ reviewed the draft 2008 IR and found no instances where nitrate/nitrite or phosphorus are listed as category 5, or any other category, and dissolved oxygen (DO) is not also listed as an impairment in the appropriate category. LDEQ requests that commenters provide specific instances where this occurred so that the appropriate correction(s) can be made.

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	7. TELC comment I.G: LDEQ DO criteria is inconsistent with Louisiana regulatory standards.	7. Louisiana Environmental Regulatory Code (ERC) allows for DO concentrations <i>below</i> the established criterion. LDEQ's criterion states "Naturally occurring variations below the criterion specified may occur for short periods. These variations reflect such natural phenomena as the reduction in photosynthetic activity and oxygen production by plants during hours of darkness." LDEQ's use of the "10% rule" allows for natural fluctuations (ERC 33:IX.1113.C.3). In addition, USEPA IR guidance for assessing chemical criteria, including "conventional" parameters, as opposed to organics or metals, allows up to 10% of the samples to exceed the criteria. In the case of DO this process would be reversed to allow for up to 10% of the samples to fall below the criteria.
	8. TELC comment I.H: LDEQ uses improper methodology in testing for dissolved oxygen.	8. LDEQ's procedures for the water quality monitoring network typically specify morning ambient sample collection for dissolved oxygen and other parameters. As a result, LDEQ is sampling for dissolved oxygen at or near the lowest point in the diurnal curve for a water body, which is conservative in that it is more likely to cause a water body to be listed for low dissolved oxygen. Moreover, LDEQ has conducted 24-hour continuous monitoring and found that the lowest DO concentrations generally occur during the morning hours. It is recognized that diurnal curve sampling for dissolved oxygen may present the best vision of dissolved oxygen conditions in a water body.
	9. TELC comment I.I: LDEQ's methodology for ambient water quality monitoring is insufficient in failing to use all historical data.	9. The period of record used by LDEQ (1/1/2004 – 10/30/2007) is designed to assess current water quality conditions. While it is true that some of LDEQ's ambient sample data extends back to 1958, it is not scientifically reasonable to use data that old when assessing <i>current</i> conditions. Conditions could have worsened or improved during the extended period of record.
	10. TELC comment II: General comment – LDEQ fails to follow appropriate USEPA guidance.	10. The preface to USEPA's current Consolidated Assessment and Listing Methodology (CALM) contains the following disclaimer: This document provides guidance to USEPA and states, territories and authorized tribes regarding water quality monitoring and assessment programs. This document does not create any legally binding requirements, but rather suggests approaches that may be used as appropriate. This document does not substitute for USEPA's statutes and regulations, and interested parties are free to raise questions and objections about the appropriateness of the application of the examples presented in this guidance to a particular situation. USEPA may change this guidance in the future.
	11. TELC comment II.A: According to CALM guidance, LDEQ fails to treat threatened water bodies as impaired.	11. See response to comment 10 regarding CALM guidance. LDEQ does not incorporate this aspect of CALM guidance into its assessment methodology at this time.
	12. TELC comment II.B: According to CALM guidance, LDEQ's sample size is inadequate for water quality assessment.	12. See response to comment 10 regarding CALM guidance. LDEQ's current monitoring design is included in the Quality Assurance Project Plan, which has been approved by USEPA. LDEQ's monitoring program is designed to balance available resources with meaningful environmental results.
	13. TELC comment II.C: According to CALM guidance, a water body should be considered impaired by conventional human pollutants whenever more than 10 percent of the samples exceed the criterion.	13. See response to comment 10 regarding CALM guidance. LDEQ uses the 10% rule for all assessments except for bacteria and secondary parameters. The parameters of temperature, pH, chloride, sulfate, TDS and turbidity are considered secondary non-human health parameters. Fecal coliform assessments are conducted according to Louisiana ERC 33:IX.1113.C.5.a and b.

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	14. TELC comment II.D: According to CALM guidance, a water body should be considered impaired by chemical toxics for humans whenever there is more than one (1) excursion above a criterion.	14. See response to comment 10 regarding CALM guidance. LDEQ conducts assessments according to the method referenced in the comment. Table 2 of the 2008 IR Rationale states that <i>2 or more</i> exceedances of toxics and metals criteria in the most recent consecutive 3-year period will result in the water body being listed as “Not Supporting.”
	15. TELC comment II.E: According to CALM guidance, a water body should be considered impaired for human-health chemical criteria whenever the annual mean concentration exceeds a criterion.	15. See response to comment 10 regarding CALM guidance. LDEQ applies the assessment method of no more than one exceedance in a 3-year period when assessing human health criteria for toxics.
	16. TELC comment II.F: According to CALM guidance, LDEQ’s sampling program should include sediment sampling and whole sediment toxicity tests and data interpretations.	16. See response to comment 10 regarding CALM guidance. LDEQ does not currently have sediment criteria in the Louisiana ERC. Sediment sampling is conducted by LDEQ in the event of specific suspected cases of sediment contamination, as part of remediation and/or other surveillance related activities.
	17. TELC comment II.G: The CALM Guidance states that “biological surveys shall be fully integrated with toxicity and chemical-specific assessment methods in State water quality programs.” The comment also states, “biological surveys should be used together with whole-effluent and ambient toxicity testing, and chemical-specific analyses to assess attainment/non-attainment of designated areas.”	17. See response to comment 10 regarding CALM guidance. LDEQ conducts biological surveys to determine the extent of mercury contamination of fish and the need for fish consumption advisories. This information is used in IR assessments in the event that fish consumption advisories are issued by the Louisiana Department of Health and Hospitals (LDHH), in conjunction with LDEQ. In addition to the Mercury Program sampling, LDEQ has conducted other fish tissue contaminant monitoring, and ambient toxicity testing on the Mississippi River, the Calcasieu estuary and other localized areas of concern. Results of this biological sampling have been incorporated into the IR.
	18. TELC comment II.H: The CALM guidance recommends that all states transition to <i>E. coli</i> and Enterococci criteria.	18. See response to comment 10 regarding CALM guidance. Enterococci criteria are used by the LDHH for its Beach Monitoring Program as required by USEPA. Results of this testing were used by LDEQ to determine beach impairments for the 2008 IR.
	19. TELC Comment II.I: According to CALM guidance LDEQ’s bacteria criteria for oyster production does not meet the minimum criteria set forth by the USEPA.	19. See response to comment 10 regarding CALM guidance. LDEQ’s fecal coliform monitoring for oyster propagation waters is based on ERC 33:IX.1113.C.5.d.
	20. TELC Comment II.J: LDEQ does not use core and supplemental water quality indicator parameters from both the CALM Guidance and the USEPA-developed Elements of a State Water Monitoring and Assessment Program.	20. See response to comment 10 regarding CALM guidance. LDEQ’s monitoring program operates under a QAPP that has been approved by USEPA.
	21. TELC Comment II.K: LDEQ’s acute and chronic criteria allowing 2 or more exceedances during a 3-year period is less protective of water quality than the 1 exceedance recommended in the CALM guidance.	21. See response to comment 14.

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	22. TELC Comment II.L: LDEQ does not require risk-based tissue testing which is recommended in CALM guidance.	22. See response to comment 17 with regard to mercury and other fish tissue monitoring activities.
	23. TELC Comment III: LDEQ should include on its §303(d) list nearshore waters west of the Mississippi River for nitrate/nitrite, phosphorus, and dissolved oxygen.	<p>23. Subsegments 021102 – Barataria Basin Coastal Waters; 070601 – Mississippi River Basin Coastal Waters; and 120806 – Terrebonne Basin Coastal Waters will be listed for the suspected cause of “Oxygen, Dissolved” based on additional data provided by USEPA Region 6. Suspected impairment will be reported as Integrated Report Category 4b, which indicates that a corrective action other than a TMDL will be used to address the suspected impairment. See attachment 1 for additional information.</p> <p>Nitrate/nitrite and phosphorus will not be listed as impaired because no nutrient criteria have been developed for these parameters and, therefore, no accurate assessment may be made (see also LDEQ response to TELC comment 24).</p>
	24. TELC Comment IV: LDEQ should include on its 303(d) list the Mississippi and Atchafalaya Rivers for dissolved oxygen, nitrate/nitrite and phosphorus.	24. Louisiana’s ERC does not currently contain numerical criteria for nitrate/nitrite or phosphorus; therefore, there is no basis for assessing these waters for these nutrient values. LDEQ is developing nutrient criteria for Louisiana waters as part of its plan, <i>Developing Nutrient Criteria for Louisiana</i> , which can be found on the LDEQ Web site. Further, dissolved oxygen concentrations in both rivers are well above the dissolved oxygen criterion of 5.0 mg/L. Based on established IR protocols this indicates that neither river is impaired by nutrients or DO. For more information on this process please see the 2008 IR, Part III, Chapter 2, 2008 Water Quality Assessment Procedures, Nutrient Assessment Procedures.
	25. TELC Comment V.A: LDEQ fails to provide sufficient information about criteria it uses in table 2 of the Rationale.	25. Clean Water Act regulations state, “A description of the methodology used to develop the list;” (40 CFR§130.7(b)(6)(i)) should be provided with the §303(d) assessment. LDEQ provided its assessment methodology and detailed descriptions in table 2 of the Rationale. Further, the Rationale specifically states, “Designated uses and criteria for each water body subsegment are listed in Louisiana’s ERC 33:IX.1123.”
	26. TELC Comment V.B: LDEQ’s Rationale does not provide details about the methods used in collecting and analyzing data relied on in determining if a designated use was impaired.	26. See response to comment 3.
	27. TELC Comment V.C: LDEQ fails to provide criteria for regional staff to recommend water bodies to be listed as category 4c.	27. Based on direction by USEPA Region 6, LDEQ is not currently using category 4c.

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	28. TELC Comment V.D: LDEQ fails to include its procedure for determining the need or methodology for a use attainability analysis (UAA).	28. Statements in the IR about the need for UAAs are based on observations by regional staff and their best professional judgment that criteria impairments may be caused by natural conditions, not anthropogenic sources. The final determination of whether a UAA is conducted on a water body is based on available data and state (ERC 33:IX.1109.C) and federal regulations and guidance. If necessary, additional data and information will be collected in order to confirm or reject the preliminary IR determination that a UAA is needed. Methods for UAA studies are described in the completed UAA report and any corresponding Quality Assurance Project Plans.
	29. TELC Comment V.E: LDEQ's Rationale would misapply categories 2 and 4c.	29. Category 2 and 4c were not used in the 2008 IR.
	30. TELC Comment V.F: LDEQ's 5RC category is unsupported and does not describe the criteria or time frame for determining whether water quality impairment is due to natural conditions.	30. LDEQ's use of subcategories (such as 5RC) follows USEPA's current CALM guidance and has also been discussed with and supported by USEPA. There is no regulatory time frame for making this determination.
	31. TELC Comment VI: The public notice Rationale contains insufficient information to make informed comments and denies meaningful public participation.	31. LDEQ's public notice is based on fulfilling federal requirements of §303(d) of the Clean Water Act and contains all information or references to supporting documentation needed for review. See response to comment 3, above.
	32. TELC Comment VI.A: LDEQ public notice documents fails to include complete IR.	32. LDEQ's public notice is based on fulfilling federal requirements of §303(d) of the Clean Water Act and contains all information or references to supporting documentation needed for review. See LDEQ response to Comment 3, above.
	33. TELC Comment VI.B: LDEQ fails to provide specific references to and reasons for changes in water body classification between the 2008 IR and the previous 2006 IR.	33. LDEQ is under no federal or state requirement to point out specific changes between IR reporting years. See response to comment 3, above.
	34. TELC Comment VII: LDEQ must meet its constitutional duties as public trustee and steward of the environment.	34. Please see all preceding responses to Comments 1-33 regarding the requirements of the Clean Water Act and Louisiana Environmental Quality Act in developing the 2008 IR.
R. Eugene Turner, Professor, Department of Oceanography and Coastal Sciences, Louisiana State University Received 10/14/2008	1. Louisiana's coastal waters (within 3 miles or less of the shoreline) are impaired with respect to oxygen concentrations.	1. Subsegments 021102 – Barataria Basin Coastal Waters; 070601 – Mississippi River Basin Coastal Waters; and 120806 – Terrebonne Basin Coastal Waters will be listed for the suspected cause of "Oxygen, Dissolved" based on additional data provided by USEPA Region 6. Suspected impairment will be reported as Integrated Report Category 4b, which indicates that a corrective action other than a TMDL will be used to address the suspected impairment. See attachment 1 for additional information. Nitrate/nitrite and phosphorus will not be listed as impaired because no nutrient criteria have been developed for these parameters and, therefore, no accurate assessment may be made (see also LDEQ response to TELC comment 24).

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	<p>2. The cause of the low oxygen zones offshore is the nutrient loading in the Mississippi River. Therefore, water quality in the Mississippi River is itself “impaired.”</p>	<p>2. Louisiana’s ERC does not currently contain numerical criteria for nitrate/nitrite or phosphorus; therefore, there is no basis for assessing these waters for these nutrient values. LDEQ is developing nutrient criteria for Louisiana waters as part of its plan, <i>Developing Nutrient Criteria for Louisiana</i>, which can be found on the LDEQ Web site. Further, dissolved oxygen concentrations in both rivers are well above the dissolved oxygen criterion of 5.0 mg/L. Based on established IR protocols this indicates that neither river is impaired by nutrients or DO. For more information on this process please see the 2008 IR, Part III, Chapter 2, 2008 Water Quality Assessment Procedures, Nutrient Assessment Procedures.</p>
<p>189 citizen emails containing a standard form letter. Received between 10/9/2008 and 10/16/2008</p>	<p>“Because of the extremely low oxygen in Louisiana’s coastal waters, Louisiana should list all of its nearshore waters (coastal waters to the 3-mile limit) west of the Mississippi River and both segments of the Mississippi River for nitrate/nitrite, phosphorus, and dissolved oxygen.”</p>	<p>Subsegments 021102 – Barataria Basin Coastal Waters; 070601 – Mississippi River Basin Coastal Waters; and 120806 – Terrebonne Basin Coastal Waters will be listed for the suspected cause of “Oxygen, Dissolved” based on additional data provided by USEPA Region 6. Suspected impairment will be reported as Integrated Report Category 4b, which indicates that a corrective action other than a TMDL will be used to address the suspected impairment. See attachment 1 for additional information.</p> <p>Nitrate/nitrite and phosphorus will not be listed as impaired because no nutrient criteria have been developed for these parameters and, therefore, no accurate assessment may be made (see also LDEQ response to TELC comment 24).</p>
<p>Lake Pontchartrain Basin Foundation (LPBF) Received 9/23/2008</p>	<p>LPBF requests that the following delisted (removed from the 2008 IR category 5 or §303(d) list) water bodies Tangipahoa River, Tchefuncte River, Bogue Falaya River, Bayou Lacombe, Cane Bayou, and Bayou Bonfouca be placed back on the §303(d) list for TMDL development.</p>	<p>As noted by LPBF, significant improvements have been made in the water bodies cited in their comments which are now meeting water quality criteria for primary and secondary contact recreation. Under the statutes and regulations of the Clean Water Act as well as under USEPA guidance these water bodies have been removed from the §303(d) list or IR category 5 and will not be relisted at this time. Considerable efforts by LPBF and LDEQ have been made in this region of Louisiana and removal from the §303(d) list is an indication of success. From a practical standpoint, this recognition frees LDEQ’s TMDL development resources to address other water bodies that are not meeting their designated uses. However, this in no way reduces the level of protection for those water bodies which have improved and are now meeting water quality goals.</p> <p>It is important to note that removal of a water body from the §303(d) list (IRC 5 and IRC 5RC), for any reason, does not remove water quality protections from that water body. All water bodies in Louisiana, listed or not listed, are subject to the same protections under the CWA and Louisiana’s Environmental Quality Act (LEQA) (LEQA, 1995). Permitted facilities are still subject to conditions of their permits. Unpermitted point source dischargers are still required to obtain a permit or face enforcement actions. Violators of permit conditions are still subject to enforcement action. And, contributors to nonpoint sources of pollution are still encouraged to follow best management practices as developed by LDEQ’s Nonpoint Source Program and its many collaborators.</p>
<p>Louisiana Department of Environmental Quality (LDEQ) Interim Updates and Corrections</p>	<p>During the extended review period conducted between USEPA Region 6 and LDEQ several assessment, TMDL finalization, and correction updates were identified. These updates were made at this time in the interest of providing the most accurate and up-to-date 2008 Integrated Report possible. All changes</p>	<p>See Attachment 2, which consists of Appendix 1 of the final 2008 IR, for a list of assessment and reporting category changes during the interim review period. All changes made following public notice of the original 2008 IR have been noted and highlighted in that document.</p>

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8/11/2009	are supported by data, follow established protocols, and simply represent updates with new data, information, or corrections to the original 2008 IR reporting. All data is available upon request. These changes are noted subsegment by subsegment in attachment 2.	

Attachment 1: Response to comments concerning Gulf of Mexico hypoxic zone
Comments from Tulane Environmental Law Clinic (TELC); R. Eugene Turner, Ph.D.; and
Citizen email: Louisiana Department of Environmental Quality (LDEQ) should include on
its §303(d) list nearshore waters west of the Mississippi River for nitrate/nitrite,
phosphorus, and dissolved oxygen.

Response: LDEQ has long acknowledged that hypoxic conditions exist during certain periods of the year in offshore waters of the Gulf of Mexico outside the State three-mile limit. LDEQ also recognizes that elevated nutrient levels associated with spring and summer runoff from the Mississippi Basin are a contributing factor in development of the hypoxic zone. In recognition of this, LDEQ has participated in the Mississippi River/Gulf of Mexico Watershed Nutrient Task Force and development of the *Gulf Hypoxia Action Plan 2008 (GHAP)*, as well as its predecessor documents. The GHAP was also signed by the U.S. Environmental Protection Agency (USEPA) and numerous other Federal and State agencies with an interest in reducing the hypoxic zone and its effects on the gulf. LDEQ has been and remains a member agency of other national workgroups and task forces including the Gulf of Mexico Alliance charged with addressing the hypoxic zone. For more information on USEPA and State efforts to reduce hypoxia in the Gulf of Mexico and to obtain copies of the GHAP go to: <http://www.epa.gov/msbasin/index.htm>. The question remains, however, whether the hypoxic zone affects waters *within* the State's three-mile limit, thus representing an impairment to coastal subsegments subject to State 305(b) and 303(d) reporting requirements.

As part of its comments package TELC on behalf of Gulf Restoration Network (GRN) submitted four attachments (Attachments 2-5). LDEQ has reviewed these attachments. While these documents do indicate hypoxic conditions exist outside the State three-mile limit, they provide no substantive information pointing to hypoxic conditions *within* the three-mile limit.

- Attachment 2, labeled "Dr. Turner Letter" includes a group of papers by Dr. Turner et al. describing his research on the causes of hypoxia in the Gulf of Mexico. These papers, some referencing data collected outside the period of record (1/1/2004-10/30/2007) used for the 2008 IR, primarily point to high nutrient levels and their effects on hypoxic conditions. However, they do not specify that these hypoxic conditions exist within the State three-mile limit. (The Louisiana Offshore Oil Port (LOOP) data does report hypoxic conditions that may be within the three-mile limit. However, this data set ends in 1995, well before the period of record for the 2008 IR.)
- In Attachment 3, which consists of USEPA's 2002 response to comments on a Mermentau Coastal Waters TMDL, USEPA specifically stated that the data provided by the TMDL commenters (Earth Justice on behalf of Sierra Club and Louisiana Environmental Action Network) *does not* support a finding of hypoxic condition within the State three-mile limit in question for the TMDL.
- TELC/GRN Attachment 4 provides a map of the 2007 hypoxic zone produced for a Louisiana Universities Marine Consortium (LUMCON) press release. Based upon the generalized shading used this does appear to point to hypoxic areas within portions of the State three-mile limit. The resolution of this map is very poor, making it impossible to confirm sampling locations used for map production; therefore, this map does not support the commenters' conclusion that hypoxic areas are present within the State three-mile limit.
- Lastly, Attachment 5, which consists of "Raw Data from Dr. Rabalais re: Hypoxia Zone,"

refers to data collected from 1985-2001. This is outside the period of record used for the 2008 IR.

In addition to these attachments, TELC/GRN provided links to the LUMCON Web site that provided raw data in tabular form. Upon review of the Web site LDEQ found that this data set was labeled, “not quality controlled.” In addition, there was no indication of the dates and geographic coordinates (latitude and longitude) for the sites in question. Therefore, this data could not be used for an assessment.

In order to fully investigate TELC/GRNs comment and to supplement LDEQ’s existing ambient water quality data, LDEQ was able to obtain raw data for the Gulf of Mexico nearshore waters from USEPA Region 6. After detailed review it was determined that this data was specific to sample sites within the State three-mile limit. It consisted of raw data in Excel format collected by the Louisiana Universities Marine Consortium (LUMCON), USEPA Gulf Breeze Laboratory in Florida, and the Gulf States Marine Fisheries Program-SeaMap sampling efforts. Additional data was also obtained from the Louisiana Department of Wildlife and Fisheries (LDWF). All data analyzed was collected between 2004 and 2008 in keeping with LDEQ’s procedures for the 2008 IR. Because this data was collected as part of state or federal research projects, it was assumed that proper quality control procedures were followed per existing grant commitments or peer review publication requirements. The LUMCON and Gulf Breeze dissolved oxygen (DO) concentrations were measured at multiple depths through the water column at each site/date sampled. LDWF DO concentrations were measured at the surface and at trawl depth which was near the bottom in the trawl area. Trawl depths for LDWF were 10, 20, and 30 feet. SeaMap DO was measured on or near the bottom.

LDEQ’s routine ambient surface water sampling and assessment procedures were the basis for the original 2008 IR assessment of full support of the DO criterion for all coastal subsegments. The DO criterion for all offshore coastal subsegments is 5.0 mg/L. These samples are collected at 1 meter or half the distance to the bottom if the depth is less than 1 meter. LDEQ does not currently have a sampling or assessment procedure for considering data collected at multiple depths through the water column. In addition, LDEQ’s existing DO criteria are assumed to represent surface water conditions for which the criteria were developed, although this assumption is not specified in the applicable regulation (LAC 33:IX.1113.C.3). It is well known that deep bodies of water such as lakes, large rivers and the Gulf of Mexico will have naturally lower DO concentrations at or near the bottom due to thermal or saline stratification and reduced or absent mixing with well aerated surface waters. These factors make it difficult to accurately assess for hypoxic conditions based on water column profile data. LDEQ’s routine ambient sampling and assessment protocol indicated full support for the State nearshore Gulf waters. The additional data provided by USEPA, LDWF and SeaMap represented the three coastal subsegments of:

- 021102 – Barataria Basin Coastal Bays and Gulf Waters to the State Three Mile Limit;
- 070601 – Mississippi Basin Coastal Bays and Gulf Waters to the State Three Mile Limit;
- 120806 – Terrebonne Basin Coastal Bays and Gulf Waters to the State Three Mile Limit.

LUMCON and Gulf Breeze data was analyzed as “site/dates.” A site/date consists of multiple DO readings taken through the water column from near the surface to near the bottom at a particular site and date. Analyzing these two additional data sets indicated that surface water (approximate depth of 1 meter) DO concentrations fully supported the DO criterion based on

LDEQ's standard assessment protocol for DO. This initial review only considered surface water data, not the data collected throughout the water column.

Taking the full water column into consideration the Gulf Breeze data showed;

- 43 of 58 sample site/dates in these three subsegments showed > 10% of the DO readings through the water column were < 5 mg/L DO.
- There were 28 site/dates in 070601 with > 10% of readings < 5 mg/L DO, 14 in 021102, and one in 120806.
- Of these 43 site/dates 11 had > 10% of the readings < 2 mg/L DO.
- Nine of these 11 site/dates occurred in 021102, with one each in 070601 and 120806.

LUMCON data showed that;

- 12 of 15 sample site/dates had > 10% of the DO readings < 5 mg/L DO.
- Eight site/dates in 021102 had >10 percent of DO readings < 5 mg/L.
- 120806 had three site/dates and 070601 had one site/date with >10% of the readings < 5 mg/L DO.
- Five of the site/dates found > 10% of the readings < 2 mg/L DO. Four of these five occurred in 021102 and one in 070601.

A DO concentration of 2.0 mg/L was used for review purposes. While 2.0 mg/L is not a DO criterion for Louisiana's coastal waters, it is a widely accepted benchmark for hypoxic conditions.

Louisiana Department of Wildlife and Fisheries (LDWF) and SeaMap data was much more difficult to summarize; however, the two data sets also showed areas of low DO at or near the bottom. Trawl data from these projects, while highly variable both spatially and temporally, showed reduced catch rates in some instances. These generally occurred more frequently in areas where low DO was found at or near the bottom prior to the trawl run.

As noted above, due to the water column nature of the data it was not possible to analyze the additional data sets using LDEQ's normal assessment process. The period of time and precise spatial distribution over which low DO occurred could not be well defined because most of the sampling was limited to short periods during the summer. In addition, both LUMCON and SeaMap sample transects were approximately 20-30 miles apart, making it impossible to determine the precise spatial extent of the hypoxic zone in the intervening area, especially where it pertains to the near coastal waters within the State three-mile limit. Despite these difficulties and limitations, careful analysis of the additional data supplied by USEPA Region 6, LDWF and SeaMap indicated that multiple areas of low DO occurred at or near the bottom of the Gulf of Mexico within the State three-mile limit during the period 2004-2008.

Therefore, based on the reviewed supplemental data provided and the caveats noted above, LDEQ has determined that the coastal subsegments of: 021102 – Barataria Basin Coastal Bays and Gulf Waters to the State Three-Mile Limit; 070601 – Mississippi Basin Coastal Bays and Gulf Waters to the State Three Mile Limit; and 120806 – Terrebonne Basin Coastal Bays and Gulf Waters to the State Three-Mile Limit are suspected of impairment due to low DO at or near the bottom of the water column. This suspected impairment is believed to exist primarily during summer months but the temporal nature of the data precludes adequate analysis outside the summer sampling period. The suspected source of impairment has been reported as "upstream sources."

The remaining coastal subsegments either did not experience the same extent of low DO during the period of record or there was insufficient data with which to make a determination. This

finding is in keeping with other coastal deltaic regions where offshore zones of hypoxia occur due to high nutrient loading from large source rivers.

In addition to determining impairment, LDEQ must make a determination of the IR category in which to place these subsegments. The Mississippi River Gulf of Mexico Watershed Nutrient Task Force, using multiple sources of independent research, including some cited by GRN, has established that approximately 78% of nitrogen and 66% of phosphorus entering the Gulf of Mexico from the Mississippi River is derived from nonpoint sources of nutrients from the Mississippi and Ohio River Basins. Based on the fact that the hypoxic zone is caused largely by drainage from approximately 41% of the contiguous United States, LDEQ believes it is impossible for LDEQ or USEPA to develop a meaningful or implementable TMDL. As has been noted, LDEQ, USEPA and numerous other state and federal agencies are already engaged in a substantial water quality management program known as the GHAP. The goal of this plan is to reduce the hypoxic zone to less than 5,000 square kilometers by 2015, or approximately half the current five-year average. This goal is substantially sooner than the time frame allowed by USEPA to develop a TMDL. Under current USEPA guidance, states have up to 13 years to develop a TMDL for water bodies listed in category 5 of the Integrated Report. This would extend TMDL development to 2022, thus potentially delaying implementation of remedial actions in the Mississippi River basin.

Based on an analysis of the data discussed and development of the GHAP, LDEQ has determined that subsegments 021102, 070601, and 120806 will be reported on the 2008 IR as being suspected of impairment due to low DO and placed in category 4b. Category 4b is used for impairments caused by a pollutant that is being addressed by the State through other pollution control requirements. Other pollution control requirements were defined by USEPA guidance as including best management practices. LDEQ currently uses category 4b for impairments due to noxious aquatic plants using the Louisiana Aquatic Invasive Species Council as a TMDL alternative program. In addition, LDEQ uses category 4b for several legacy pollution issues being addressed by remediation activities either completed or in progress.

During the course of this IR review, USEPA Region 6 provided a six point matrix for determining if a nonpoint source watershed plan such as the GHAP is suitable for changing a category 5 (303(d) list) water body to category 4b. This matrix is shown in table 1. LDEQ's determination of how the GHAP meets these requirements is included in the third column.

Table 1: USEPA matrix for determining if a watershed action plan is suitable for use as an Integrated Report Category 4b substitute for Category 5.

USEPA 2006 IR Guidance	USEPA Nonpoint Source (NPS) Program Guidance (Numbering taken from original USEPA document)	LDEQ Assessments and Gulf Hypoxia Action Plan 2008 (GHAP) (page numbers refer to GHAP)
1) A statement of the problem causing the impairment	1) Identify causes and sources needed to be controlled to achieve estimated load reductions, and the estimated extent to which they are present in the watershed 2) An estimate of load reductions expected	1) LDEQ's 2008 Integrated Report (IR) identified low dissolved oxygen as a suspected impairment for subsegments 021102, 070601, and 120806. "Upstream sources," "agriculture," and "source unknown" were reported as the suspected sources of impairment. Nitrogen and phosphorus were not listed as suspected causes of impairment due to the lack of criteria for these parameters. 2) GHAP specifies a) phosphorus and nitrogen as the primary contributors to hypoxia (page 22); b) nonpoint sources represent 78% and 66% of nitrogen and phosphorus loading, respectively (page 23); c) estimates a dual nutrient strategy targeting at least a 45% reduction in nitrogen and phosphorus loading as measured against 1980-1996 average load (page 22)
2) Description of the implementation strategy and controls necessary to achieve water quality standards, including the point and nonpoint source loadings, that when implemented will assure attainment of all applicable water quality standards	3) Description of NPS management measures needed to achieve loads reductions, an identification of critical areas to achieve greatest reduction 4) Estimate of technical and financial assistance needed to implement plan 5) Information and education component for improving understanding of the need for management measures that control nonpoint sources	1) The GHAP section "Actions to Accelerate the Reductions of Nitrogen and Phosphorus" (pages 28-39) describes the NPS management measures needed to achieve load reductions and identify critical areas. In addition to existing state and federal NPS management activities the GHAP calls for development of additional strategies by 2013. 2) Technical and financial incentives are called for through the 319 program, Farm Bill, and other federal funding sources (page 33) 3) The entire GHAP as well as existing 319 and Farm Bill programs include "information and education component(s) for understanding the need for management measures that control nonpoint sources." 4) Pages 56-57 of the GHAP specifically addresses effective communication to increase awareness of hypoxia
3) An estimate of the time frame to meet water quality standards	8) (numbering error in original) Criteria to determine whether load reductions are being achieved and progress is being made to attain standards, and if not, whether plan needs to be revised, or if TMDL needs to be revised	1) GHAP calls for an approximately 50% reduction in hypoxic zone area by 2015 (pages 9 and 14); 2) State, federal, and university monitoring will determine if load reductions are being achieved and progress is being made to attain standards (page 50)

USEPA 2006 IR Guidance	USEPA Nonpoint Source (NPS) Program Guidance (Numbering taken from original USEPA document)	LDEQ Assessments and Gulf Hypoxia Action Plan 2008 (GHAP) (page numbers refer to GHAP)
4) Reasonable schedule for implementation of control measures	6) (numbering error in original) Schedule for implementing management measures that is reasonably expeditious	1) GHAP reports on current progress in implementing management measures (page 17-19) 2) The goal of the GHAP is an approximately 50% reduction in the size of the hypoxic zone by 2015 (pages 9 and 14). This is seven years prior to completion of a TMDL, assuming these subsegments were listed in category 5 instead of category 4b as proposed by LDEQ. 3) Current NPS management practices should be continued and encouraged while improved strategies and implementation should be started by 2013. This is nine years before development of a TMDL would be required under category 5 listing.
5) Description of, and schedule for, monitoring milestones for tracking and reporting progress to USEPA on implementation of BMPs	7) Interim, measurable milestones for determining whether NPS management measures or other control actions are being implemented 8) Monitoring component to evaluate implementation efforts measured against #8	1) See LDEQ and GHAP comments associated with 2006 IR Guidance statement 1, above. 2) Monitoring by State, Federal and university research programs is ongoing; therefore, a specific monitoring schedule is not necessary.
6) A commitment to revise, if necessary, the implementation strategy if it is determined that progress in meeting water quality standards is not satisfactory	See 8) above	1) LDEQ is committed to ongoing work with the Mississippi River/Gulf of Mexico Watershed Nutrient Task Force. As such, it is committed to revising the GHAP implementation strategy, within the boundaries of the task force, as needed to achieve meaningful reductions in hypoxia in the Gulf of Mexico. 2) GHAP calls for a reassessment of nitrogen and phosphorus load reductions and hypoxic conditions in 2013. As part of this the GHAP states it will “determine appropriate actions to continue to implement or, if necessary, revise this strategy.” (page 58)